

Watering Your Shade Trees

Trees constantly lose water to the atmosphere. Water is the single most limiting essential resource for tree survival and growth. Water shortages severely damage young and old trees alike, and set up healthy trees for other problems. Drought conditions can lead to tree decline, pest problems and non-recoverable damage. Supplemental watering can greatly assist in maintaining tree health during droughts—both during the growing season or during the dormant season.

What is water stress?

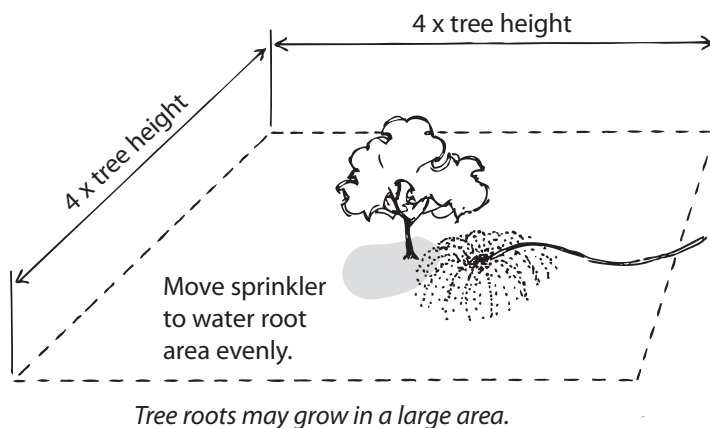
Tree growth and health require an adequate supply of water throughout the year. During most parts of the year, natural rainfall is sufficient to sustain trees. Most healthy trees can even sustain periods of moderate dryness. However, the summer months usually contain periods of several weeks without any precipitation.

Whenever a tree loses moisture through its leaf surface and is not able to replace it, “water stress” develops within the tree. Windy conditions can accelerate the stress process by increasing the amount of moisture being lost through the leaf surfaces.

Symptoms of water stress include leaf droop and the eventual drying of the leaf. Water stress may not kill a tree outright, but it could weaken a tree and predispose it to other insect and disease problems.

Facts about trees and water

- Living plants are up to 90 percent water.
- About 99 percent of the water taken up by tree roots evaporates from the leaves through transpiration.
- A mature tree can lose hundreds of gallons of moisture a day.
- An ideal soil for root growth is $\frac{1}{4}$ water, $\frac{1}{4}$ air and $\frac{1}{2}$ solids.
- Browning, wilting, scorch and dieback after very hot and cold weather usually are caused by lack of available water.



How do I water trees?

Trees that are established within your landscape can be watered through several methods.

Manually, the best ways to water trees are by soaker hose or trickle (drip) irrigation, which you turn on and off. Sprinklers are less efficient for applying water to trees than soaker hoses or drip irrigation, but are easy to use. Even a garden hose, moved often, can provide a good soil soaking. Take care to water the surface *beneath* the tree's canopy, but *not* the tree's canopy. Foliage that is watered can be sunscalded or could develop fungal foliage disorders.

Deep watering a tree with a pipe or wand stuck into the soil 12-24 inches is not as good for trees as surface applications. Most of the tree's absorbing roots are in the top foot of soil. Applying water deeper than this level misses the active roots and allows water to drain away from the roots, wasting efforts and water. Apply water across the soil surface and let it soak into the soil. Surface soaking allows tree roots more chances to absorb any water, helps maintain soil health, and helps maintain essential element cycling and transformations in the soil.

How much water is needed?

During these dry conditions, any amount of water is better than none at all! However, most professionals feel that a deep, thorough watering is best for the tree. If you can duplicate a rainfall of about 2 inches a week, you are doing great.

If Mother Nature provides enough precipitation to wet the soil 2 to 3 feet deep, don't apply additional water. However, if natural rainfall falls short of a full soaking, apply only enough additional water to wet the soil 2 to 3 feet deep. Apply water slowly so that it sinks deeply into the soil.

You can estimate this amount of water by placing several small containers under the canopy of your trees. When the average depth in the containers equals 2 inches, you are done with that tree. In addition, you can probe the soil to a depth of 6 to 8 inches when you are done watering to make sure the soil is saturated to that depth.

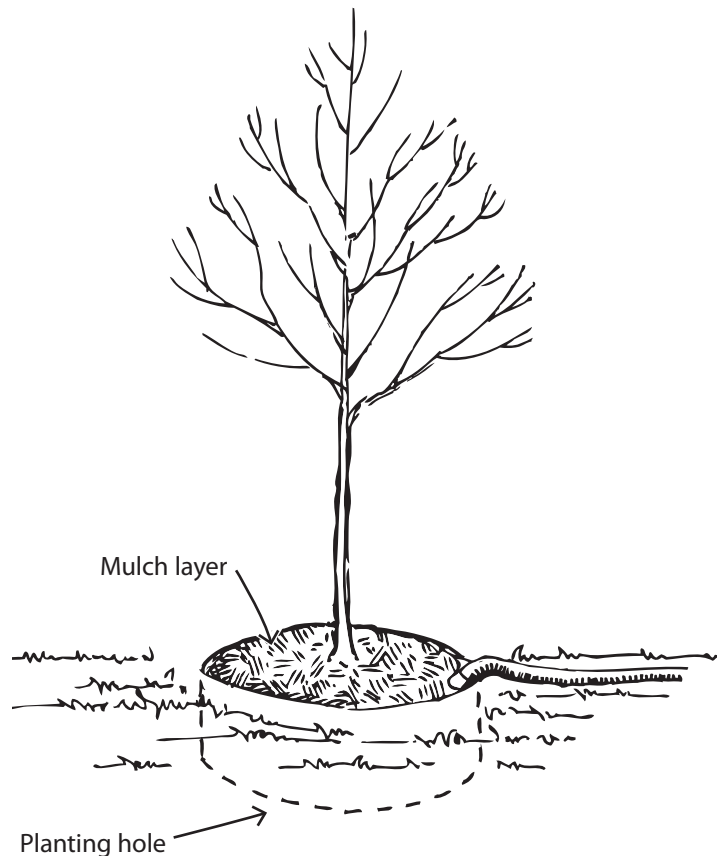
Newly planted trees are the most susceptible to water stress and should be monitored closely. Many times these trees have lost a percentage of their root system in the digging process and are not very efficient with water uptake. Concentrate on watering just the basal root system of new trees and check often with a soil probe to inspect water dispersal.

When should I water?

The best time to water is at night from 10 p.m. to 8 a.m. Trees relieve water deficits (refill) during the nighttime hours. Watering at night allows effective use of applied water and less evaporative loss, assuring more water moves into the soil and tree. The next best time to water is in late afternoon when the foliage is dry and evaporation potential is not at its daily peak.

Plan to water newly planted trees each summer for the three years after planting. Once past this establishment window, the tree should be able to survive on its own without supplemental water.

Evergreen trees, however, always will lose water during the dormant season. These trees should be watered during winter droughts. Because temperatures are low and relative humidity is typically high, much less water is required in the dormant season, but water still is needed. Do not water when the soil surface is less than 40 F.



Transplanted trees must be watered.

Can trees be overwatered?

You have heard many times that "too much of a good thing is bad." Unfortunately, that also can apply to watering trees. The clay soils common in Missouri have very little porosity; consequently, there is very little space for oxygen. When these soils are oversaturated, the little oxygen that is there is displaced and the root system of the tree is suffocated.

Well-established trees rarely are affected, but newly planted trees must be closely monitored by probing the soil to a depth of 6 to 8 inches. Research, however, has shown that many more trees are lost to dryness than from overwatering. Keep your soil moist, but not soggy, and you are well on your way to successful tree watering.



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